

PATENT
508-039.7-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the matter of: Cooper et al)	
)	
Serial No:)	Group Art Unit
()	Examiner:
Filed: Herewith)	
)	
For: Visual Display)	

ASSISTANT COMMISSIONER OF PATENTS
WASHINGTON, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Please preliminarily amend the above-referenced U.S. application as follows:

In the Specification:

Please remove all headers.

On page 1, prior to line 28 please insert a new heading:

--Summary of the Invention--.

Please replace the paragraph beginning at page 2, line 10, with the following rewritten paragraph:

--wherein the field effect emission device further comprises:

grooves provided in the front surface of the substrate, the emitter lines being formed in the grooves.--

Express Mail No. EL628641368US

Please replace the paragraph beginning at page 4, line 12, with the following rewritten paragraph:

--wherein the electronic component further comprises:

- . grooves provided in the front surface of the substrate, the conductive lines being formed in the grooves for electrical connection to the electrical component.--.

Please replace the paragraph beginning at page 5, line 33 to page 6, line 2, with the following rewritten paragraph:

--wherein the electronic component further comprises:

- . grooves for the conductive tracks provided in a surface of one or more of the substrate layers, the conductive tracks being formed in the grooves.--.

Please replace the paragraph beginning at page 9, line 5, with the following rewritten paragraph:

--wherein the substrate layers comprise:

- . at least one thin, ceramic layer and
- . a thicker, foundation, ceramic layer, the thin layer(s) having been laminated in green state to the thick layer which has previously been fired, the substrate being fired after lamination.--.

In the Claims:

Please remove all headers.

17. (Amended) A field emission device according to claim 1, wherein the substrate is a multilayer substrate having a front substrate layer and at least one additional substrate layer, with conductive vias provided through the front layer and the or each additional layer and with electrical interconnection tracks at at least some of the interface(s) between adjacent layers so arranged that a front layer via is offset from a via in a back one of the additional layer(s) to which it is electrically connected by the interconnection tracks, the back one of the additional layers being provided with a connection arrangement.

77. (Amended) An electronic component to have an electrical component incorporated thereon, the electronic component comprising:

- . a substrate having
 - . a front substrate layer with a front face for receiving the electrical component,
 - . at least one further substrate layer and
 - . via and interconnect arrangement for providing electrical connection to the electrical component the electrical connection being distributed across the front face,

characterised in that the substrate layers comprise:

at least one thin, ceramic layer and
a thicker, foundation, ceramic layer, the thin layer(s) having been laminated in the green state to the thick layer which has previously been fired, the substrate being fired after lamination.

83. (Amended) A field emission device according to claim 82, wherein the via fill material is a metal which expands by oxidation on firing of the substrate.

84. (Amended) A field emission device according to claim 82, wherein via fill material is a ruthenium containing paste.

85. (Amended) A field emission device according to claim 82, the expansible material is bulked with other material which is inert to the reaction causing expansion.

86. (Amended) A field emission device according to claim 85, wherein bulking material is a precious metal or a ceramic material.

In the Abstract:

Please remove all headers.

Please replace the paragraph and title of the Abstract of the Disclosure on page 26 at line 1 with the following rewritten paragraph.

--Abstract of the Disclosure

The front layer 1 shown in Figure 1 is being tape cast in the direction of the arrow A from alumina ceramic material 2 onto a mylar layer 3. The doctor blade 4, which regulates the thickness T of the ceramic layer has serrations 5, which form parallel grooves 6 in the front surface 7 of the layer. After the material has set, by evaporation of the moisture allowing the material to be sufficiently fluid for its casting, vias apertures 8 are punched in it, whilst it is still supported on the mylar, Figure 2. They are filled with via material 9, Figure 3, as described in more detail below. After via filing, the mylar layer is peeled from the tape cast ceramic. For use the front layer 1 is laminated onto further ceramic layer(s) and fired. The grooves 6 are filled as by sputtering.--.

Remarks


This preliminary amendment is filed for the purpose of placing the application into standard U.S. format and to eliminate multiple dependent claims. Consideration and allowance of the claims is earnestly solicited.

Attached hereto is am marked-up version of the changes made to the specification, claims and Abstract of the Disclosure by the current amendment. The attached page is captioned "Version with markings to show changes made".

Respectfully submitted,

Date:

6/1/2001


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VERSION WITH MARKING TO SHOW CHANGES MADE

In the Specification:

Paragraph beginning at line 10 of page 2 has been amended as follows:

[characterised in that] wherein the field effect emission device further comprises:

- . grooves provided in the front surface of the substrate, the emitter lines being formed in the grooves.

Paragraph beginning at page 4, line 12 has been amended as follows:

[characterised in that] wherein the electronic component further comprises:

- . grooves provided in the front surface of the substrate, the conductive lines being formed in the grooves for electrical connection to the electrical component.

Paragraph beginning at page 5, line 33 to page 6, line 2 has been amended as follows:

[characterised in that] wherein the electronic component further comprises:

- . grooves for the conductive tracks provided in a surface of one or more of the substrate layers, the conductive tracks being formed in the grooves.

Paragraph beginning at page 9, line 5 has been amended as follows:

[characterised in that] wherein the substrate layers comprise:

- . at least one thin, ceramic layer and

a thicker, foundation, ceramic layer, the thin layer(s) having been laminated in green state to the thick layer which has previously been fired, the substrate being fired after lamination.

In the Claims:

17. (Amended) A field emission device [as claim in] according to claim 1, wherein the substrate is a multilayer substrate having a front substrate layer and at least one additional substrate layer, with conductive vias provided through the front layer and the or each additional layer and with electrical interconnection tracks at at least some of the interface(s) between adjacent layers so arranged that a front layer via is offset from a via in a back one of the additional layer(s) to which it is electrically connected by the interconnection tracks, the back one of the additional layers being provided with a connection arrangement.

77. (Amended) An electronic component to have an electrical component incorporated thereon, the electronic component comprising:

- . a substrate having
 - . a front substrate layer with a front face for receiving the electrical component,
 - . at least one further substrate layer and

via and interconnect arrangement for providing electrical connection to the electrical component the electrical connection being distributed across the front face,

characterised in that the substrate layers comprise:

- . at least one thin, ceramic layer and
- . a thicker, foundation, ceramic layer, the thin layer(s) having been laminated in the green state to the thick layer which has previously been fired, the substrate being fired after lamination.

83. (Amended) A field emission device [as claimed in] according to claim 82, wherein the via fill material is a metal which expands by oxidation on firing of the substrate.

84. (Amended) A field emission device [as claimed] according to claim 82, wherein via fill material is a ruthenium containing paste.

85. (Amended) A field emission device [as claimed in] according to claim 82, the expansible material is bulked with other material which is inert to the reaction causing expansion.

86. (Amended) A field emission device [as claimed in] according to claim 85, wherein bulking material is a precious metal or a ceramic material.

In the Abstract:

Paragraph beginning at line 1 of the Abstract of the Disclosure on page 26 has been amended as follows:

Abstract of the Disclosure[VISUAL DISPLAY]

The front layer 1 shown in Figure 1 is being tape cast in the direction of the arrow A from alumina ceramic material 2 onto a mylar layer 3. The doctor blade 4, which regulates the thickness T of the ceramic layer has serrations 5, which form parallel grooves 6 in the front surface 7 of the layer. After the material has set, by evaporation of the moisture allowing the material to be sufficiently fluid for its casting, vias apertures 8 are punched in it, whilst it is still supported on the mylar, Figure 2. They are filled with via material 9, Figure 3, as described in more detail below. After via filing, the mylar layer is peeled from the tape cast ceramic. For use the front layer 1 is laminated onto further ceramic layer(s) and fired. The grooves 6 are filled as by sputtering.

[Figure 1.]